**PART 1:** LABEL THE CELL CYCLE DIAGRAM



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**Figure 10–2**

 11. The structure labeled A in Figure 10–2 is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 12. The structures labeled B in Figure 10–2 are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PART 2:** MITOSIS

Label the picture below to identify the phases of mitosis. Use these choices:

**anaphase metaphase prophase telophase**

|  |  |  |  |
| --- | --- | --- | --- |
| 1.  | 2.  | 3. \_ | 4.  |
|  |
| 5 | 6 | 7  | 8 |

Label the cell parts indicated above, using these choices:

**sister chromatids centromere spindle fibers centrioles**

**PART 3:** INTERPHASE VS MITOSIS

For each of the actions below, tell if it occurs during interphase or some phase of mitosis.

***I. Interphase M. Mitosis***

 9. Cell growth occurs.

 10 Nuclear division occurs.

 11. Chromosomes are distributed equally to daughter cells.

 12. Protein production is high.

 13. Chromosomes are duplicated.

 14. DNA synthesis occurs.

 15. Cytoplasm divides immediately after this period.

 16. Mitochondria and other organelles are manufactured.

 17. DNA may be miscopied resulting in cell changes leading to cancerous cell division

 **PART 4:** Draw the chromosomes in the cell as it undergoes **MEIOSIS**:

Prophase I Metaphase I Anaphase I Telophase I

Anaphase II Metaphase II Prophase II

Daughter Cells

Telophase II

Write the correct Meiotic Phase next to the description:

**1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** homologous chromosome line up in the center of the cell

**2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** spindle fibers pull homologous pairs to ends of the cell

**3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** 4 haploid (N) daughter cells form\

**4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** cells undergo a round of DNA replication

 **5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** sister chromatids separate from each other

**6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** 2 haploid (N) daughter cells form

**7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** spindle fibers attach to the homologous chromosome pairs

 **8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** individual chromatids move to each end of the cell

**9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** crossing‐over (if any) occurs

**PART 5:** Create a Venn Diagram to Compare and Contrast Mitosis and Meiosis

*~Use the following terms or phrases:*

**produces haploid cells produces 4 cells**

**occurs in germ cells (produces sex cells) DNA is copied once**

**occurs in plant and animal cells involves cellular division**

**In humans, produces cells with 23 cell divides only once**

 **Chromosomes**

**homologous chromosomes line up during Metaphase produces 2 cells**

 **new cells are different from each other**

**has 2 divisions**

**In humans, produces cells with 46 occurs in body (somatic) cells**

 **Chromosomes**

**Does not involve lining up of homologous crossing over occurs, creating new**

 **Chromosomes genetic combinations in offspring**

**PART 6:** FILL IN THE BLANK

**Use each of the terms below just once to complete the passage:**

**nucleus genetic material chromosomes packed
identical chromatin vanish cell division**

The process by which two cells are produced from one cell is called  **(18)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The two cells are  **(19)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the original cell. Early biologists observed that just before cell division, several short, stringy structures appeared in the  **(20)\_\_\_\_\_\_\_\_\_\_\_**\_\_\_ .These structures seemed to  **(21)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**\_\_\_ soon after cell division. These structures, which contain DNA and became darkly colored when stained, are now called  **(22)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ . Scientists eventually learned that chromosomes carry  **(23)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ , which is copied and passed on from generation to generation. Chromosomes normally exist as  **(24)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**\_\_\_ , long strands of DNA wrapped around proteins. However, before a cell divides, the chromatin becomes tightly  **(25)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ .

**PART 7:** MULTIPLE CHOICE

\_\_\_\_\_\_ 1. As a cell becomes larger, its

|  |  |
| --- | --- |
| a. | volume increases faster than its surface area. |
| b. | surface area increases faster than its volume. |
| c. | volume increases, but its surface area stays the same. |
| d. | surface area stays the same, but its volume increases. |

\_\_\_\_ 2. Which of the following is a correct statement about the events of the cell cycle?

|  |  |
| --- | --- |
| a. | Little happens during the G1 and G2 phases. |
| b. | DNA replicates during cytokinesis. |
| c. | The M phase is usually the longest phase. |
| d. | Interphase consists of the G1, S, and G2 phases. |

\_\_\_\_ 3. What is the role of the spindle during mitosis?

|  |  |
| --- | --- |
| a. | It helps separate the chromosomes. |
| b. | It breaks down the nuclear membrane. |
| c. | It duplicates the DNA. |
| d. | It divides the cell in half. |

\_\_\_\_ 4. Cancer is a disorder in which some cells have lost the ability to control their

|  |  |
| --- | --- |
| a. | size. C. growth rate |
| b. | spindle fibers. D. surface area |
|  |  |

|  |  |
| --- | --- |
|  |  |

\_\_\_\_ 5. If an organism’s diploid number is 12, its haploid number is

|  |  |
| --- | --- |
| a. | 12. c. 24 |
| b. | 6. d. 3 |
|  |  |

\_\_\_\_ 6. Gametes have

|  |  |
| --- | --- |
| a. | homologous chromosomes. |
| b. | twice the number of chromosomes found in body cells. |
| c. | two sets of chromosomes. |
| d. | one allele for each gene. |

|  |  |
| --- | --- |
|  |  |
|  |  |

\_\_\_\_ 7. What is shown in the figure above?

|  |  |
| --- | --- |
| a. | independent assortment c. crossing over |
| b. | anaphase I of meiosis d. replication  |
|  |  |

\_\_\_\_ 8. Unlike mitosis, meiosis results in the formation of

|  |  |
| --- | --- |
| a. | diploid cells. C. 2N daughter cells |
| b. | haploid cells. D. body cells |
|  |  |

\_\_\_\_ 9. Unlike mitosis, meiosis results in the formation of

|  |  |
| --- | --- |
| a. | two genetically identical cells. C. four genetically identical cells |
| b. | four genetically different cells. D. two genetically different cells |

 \_\_\_\_\_\_10. Which pair is correct?

a. G1 phase, DNA replication

b. G2 phase, preparation for mitosis

c. S phase, cell division

d. M phase, cell growth

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